ABSTRACT OF THE DISCLOSURE

The present invention relates to a method of *ex vivo* amplification of neonatal T cells from umbilical cord blood which comprises obtaining light density mononuclear cells from a sample o f umbilical cord blood and then culturing said light density mononuclear cells in a serum-deprived culture medium supplemented with various cytokine combinations. Particularly, there are reported the effects exerted by cytokine combinations including stem cell factor (SCF), interleukin-7, interleukin-4 and interleukin-2, on the amplification of T cells from cord blood mononuclear cells cultured for 10-11 days under serum-deprived conditions. Of all the combinations investigated, SCF plus interleukin-7 sustained the best fold increase (FI) of total nucleated cells (FI=6.4±1.17), amplifying preferentially $CD4^+$ over $CD8^+$ T cell subsets (FI=4.72±0.79 vs 2.73±1.2, respectively, $p<0.05$). The addition of interleukin-2 to this combination did not significantly increase the total number of cells generated (FI=7.4±2.27) but allowed preferential amplification of $CD8^+$ over $CD4^+$ T cells (FI=6.04±0.14 vs 1.67±0.6, respectively, $p<0.05$). Single strand conformation polymorphism analysis of the T-cell receptor V_β-chain rearrangements expressed by the expanded T cells indicated that the complexity of the T-cell repertoire had increased after 10 days of culture in the presence of SCF and IL-7. Interestingly, a modest expansion (FI=8.67±1.5) of myeloid progenitor cells was also observed in these cultures. These results indicate that it is possible, by modulating the cytokines added to the cultures, to expand specific T cell subsets for adoptive immunotherapy without lousing myeloid progenitor cells necessary for neutrophil recovery after cord blood transplantation.